

U.S. Patent Application No. 10/828,789
Amendment dated March 14, 2007
Reply to Office Action of December 14, 2007

MAR 14 2007**REMARKS/ARGUMENTS**

Reconsideration and continued examination of the above-identified application are respectfully requested.

By way of this amendment, new claims 91-96 have been added. Further, amendments to claims 1, 2, 9, 10, 23, and 56 have been made. Full support for the amendments to the claims can be found throughout the present application including, but not limited to, Fig. 2, pages 9, 14, 15, 16, and the examples, as well as the claims as originally filed. Accordingly, no questions of new matter should arise and entry of this amendment is respectfully requested.

Election of Species Requirement

At pages 2-3 of the Office Action, the Examiner sets forth the Election of Species Requirement. The applicants affirm the election with traverse of Group I, directed to claims 1-27, 49, 50, 52, 53, and 56. The Examiner is respectfully requested to examine the remaining species with examination of the present claims.

Rejection of claims 1-3, 6, 9, 11-13, 16-18, 25, and 52 under 35 U.S.C. §102(b) -- Hall

At pages 3-4 of the Office Action, the Examiner rejects claims 1-3, 6, 9, 11-13, 16-18, 25, and 52 under 35 U.S.C. §102(b) as being anticipated by Hall (U.S. Patent No. 2,675,310). The Examiner asserts that Hall shows the consolidating of metal powder to form dense, coherent metal by pressing to consolidate the metal enough to handle and then heating the pressed shape in a mixture of oxygen-free gases which can include a halogen gas. The rejection is respectfully traversed.

Claim 1 of the present invention relates to a method of sintering valve metal powder in order

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to form a porous bonded valve metal powder. Put another way, the present invention relates to a method of sintering a valve metal powder in order to form a sintered porous valve metal body which can be useful as a capacitor anode. The present application, for instance, at page 9, lines 8-14, states that the sintering temperature and duration preferably causes coarsening with little densification and the goal is to create a sintered valve metal material with an increase of or significant retention of pore volume and/or surface area with an increased compact strength or crush strength.

Unlike the claimed invention recited in claim 1, Hall, as appreciated by the Examiner, relates not to forming a porous bonded valve metal powder or a sintered porous body, but instead relates to the consolidation of metal powder for powder metallurgy purposes, wherein this material is consolidated such that the material is characterized as (by Hall) an "ingot," wherein bars are formed and the like. See, for instance, col. 3, lines 33-38 of Hall and elsewhere. Hall specifically states that the purpose of the invention of Hall is to consolidate metal powder to form "dense coherent metal by pressing to consolidate the material enough to handle and heating the pressed shape" See col. 1, lines 28-32 of Hall. Thus, Hall teaches the consolidation and densification of material for purposes of making ingots or metal bars or other shapes and this is not teaching the formation of a porous bonded valve metal powder. Hall teaches densification which would be the opposite of creating a porous material.

Furthermore, with respect to the new claims, Hall is not concerned with material having characteristics useful for capacitor anodes and, therefore, does not teach the particular characteristics recited in claim 91. In addition, with respect to the shrinkage diameter recited in claims 92-93, it is further noted that Hall specifically states that the material after sintering has shrunk 15% to 20%. See col. 5, lines 1-5 of Hall. Again, this is further evidence that Hall is concerned with a very complete densification of the material as opposed to a porous material.

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For these reasons, Hall does not teach the claimed invention.

Rejection of claims 1, 2, 5, 6, 9-16, 18, 25, and 52 under 35 U.S.C. §102(b) – Dietz

At pages 4-5 of the Office Action, the Examiner rejects claims 1, 2, 5, 6, 9-16, 18, 25, and 52 under 35 U.S.C. §102(b) as being anticipated by Dietz (U.S. Patent No. 3,540,663). The Examiner asserts that Dietz shows the use of solid iodine as a grinding aid to mill powder and sintering the fine metal powders by heating. This rejection is respectfully traversed.

Dietz relates to the use of iodine during grinding or milling. As indicated in Dietz, for instance, at col. 1, lines 40-48, the iodine prevents "the reestablishment of direct metal-to-metal bonds whenever two surfaces are pressed tightly together during subsequent milling." It is clear that the intent of Dietz is to use iodine to prevent the formation of a bonded valve metal powder. This would be contrary to the method of claim 1 as pending in the present application.

While Dietz does briefly mention, at col. 2, lines 50-53, that the iodine can be removed during the formation of sintered bodies by heating in a vacuum or inert atmosphere, Dietz does not teach or suggest the formation of porous bonded valve metal powder. Certainly, Dietz does not teach or suggest the formation of a porous bonded valve metal powder having a shrinkage diameter of 0.5% or less or the particular characteristics of the tantalum powder recited in claim 91. For these reasons, Dietz does not teach the claimed invention and the rejection should be withdrawn.

Rejection of claims 1, 2, 9, and 12 under 35 U.S.C. §102(b) – JP 30314747 or JP 3-197640

At page 5 of the Office Action, the Examiner rejects claims 1, 2, 9, and 12 under 35 U.S.C. §102(b) as being anticipated by JP 30314747 or JP 3-197640. The Examiner asserts that these Japanese references show a method of heating tantalum in the presence of iodine at 300 - 700° C.

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This rejection is respectfully traversed.

These two Japanese references relate to obtaining high-purity tantalum material which includes melting Ta refined by an iodine decomposition method. According to the abstract, the tantalum is eventually melted to form high-purity tantalum metal and, therefore, the Japanese references are not concerned with sintering a valve metal powder to form a porous bonded valve metal powder. The Japanese references are instead concerned with obtaining high-purity tantalum and no sintered body having porosity is achieved or would be obvious in view of these references. For these reasons, this rejection should be withdrawn.

Rejection of claims 1-3, 6-16, 18, 25, and 52 under 35 U.S.C. §102(b) – Nishizawa et al.

At pages 5-6 of the Office Action, the Examiner rejects claims 1-3, 6-16, 18, 25, and 52 under 35 U.S.C. §102(b) as being anticipated by Nishizawa et al. (U.S. Patent No. 4,720,300). The Examiner asserts that Nishizawa et al. shows a process for producing niobium metal which involves heat-treating niobium metal in the presence of iodine, and the Examiner believes that heating niobium would be a form of sintering. This rejection is respectfully traversed.

Nishizawa et al. relates to a method of purifying niobium metal using an iodization reaction. As part of this process, Nishizawa et al. is not concerned with forming a porous body, but only with removing impurities through the use of an iodization process. From a reading of Nishizawa et al., there appears to be no mention of the formation of any sintered body and, certainly, no mention of a porous sintered body. In reading Nishizawa et al., there appears to be not even a mention of using a valve metal powder since it appears in the example that the starting material was niobium pentachloride. Thus, while it is not clear what type of niobium metal was iodized, it is clear that Nishizawa et al. is not concerned with and does not show a method of sintering a valve metal

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powder to form a porous bonded valve metal powder as recited in claim 1 of the present application and, further, does not recite the shrinkage diameter of 0.5% or less or the characteristics of the tantalum powder set forth in claim 91. Accordingly, this rejection should be withdrawn.

Rejection of claims 13-16 and 18 under 35 U.S.C. §103(a) -- JP 30314747 or JP 3-197640

At pages 6-7 of the Office Action, the Examiner rejects claims 13-16 and 18 under 35 U.S.C. §103(a) as being unpatentable over JP 30314747 or JP 3-197640. The Examiner asserts that it would be obvious to use the sintering temperatures set forth in claims 13-16 and 18 in view of these references. The rejection is respectfully traversed.

These two Japanese references relate to obtaining high-purity tantalum material which includes melting Ta refined by an iodine decomposition method. According to the abstract, the tantalum is eventually melted to form high-purity tantalum metal and, therefore, the Japanese references are not concerned with sintering a valve metal powder to form a porous bonded valve metal powder. The Japanese references are instead concerned with obtaining high-purity tantalum and no sintered body having porosity is achieved or would be obvious in view of these references. The sintering temperatures set forth in claims 13-15 relate to sintering to achieve this particular porous body and, therefore, would not be obvious in view of the references relied upon by the Examiner. For these reasons, this rejection should be withdrawn.

Rejection of claims 17, 26, and 56 under 35 U.S.C. §103(a) -- Nishizawa et al.

At pages 7-8 of the Office Action, the Examiner rejects claims 17, 26, and 56 under 35 U.S.C. §103(a) in view of Nishizawa et al. The Examiner believes that it would be obvious to use the sintering time recited in claim 17 and to form a capacitor using the sintered material of

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Nishizawa et al. This rejection is respectfully traversed.

The deficiencies of Nishizawa et al. set forth above with respect to the §102(b) rejection apply equally here and, for these reasons alone, this rejection should be withdrawn. Nishizawa et al. does not teach or suggest the formation of porous sintered body as explained above. Further, the applicants respectfully disagree with the Examiner's assertion that the material of Nishizawa et al. would be capacitor-grade material or useful in capacitors. It is unclear from Nishizawa et al. if this would be true, since it appears that Nishizawa et al. is concerned with the production of superconductive thin films. See col. 1, lines 5-10. The production of films generally does not relate to porous sintered bodies, but instead relates to metal that is generally sputtered or subjected to other film forming techniques, which are quite different from the formation of porous sintered bodies useful as capacitor anodes. Accordingly, this rejection should be withdrawn.

At page 8 of the Office Action, the Examiner indicates that claims 3, 19-24, and 53 are objected to, but otherwise would be allowable. Further, the Examiner indicates that claims 27, 49, and 50 are allowable. The applicants appreciate the Examiner's indication of allowable subject matter and, in particular, claim 23 has been amended to be in independent form to include the language of claim 1 and, therefore, claim 23 should be considered allowable in view of the Examiner's comments. The applicants further believe that in view of the above comments, the remaining claims would also be allowable. The Examiner is encouraged to contact the undersigned to discuss this matter should the above comments not convince the Examiner of the allowability of the present subject matter.

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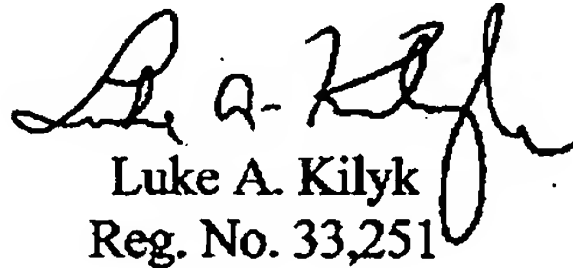
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CONCLUSION

In view of the foregoing remarks, the applicant respectfully requests the reconsideration of this application and the timely allowance of the pending claims.

If there are any fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 03-0060. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,


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